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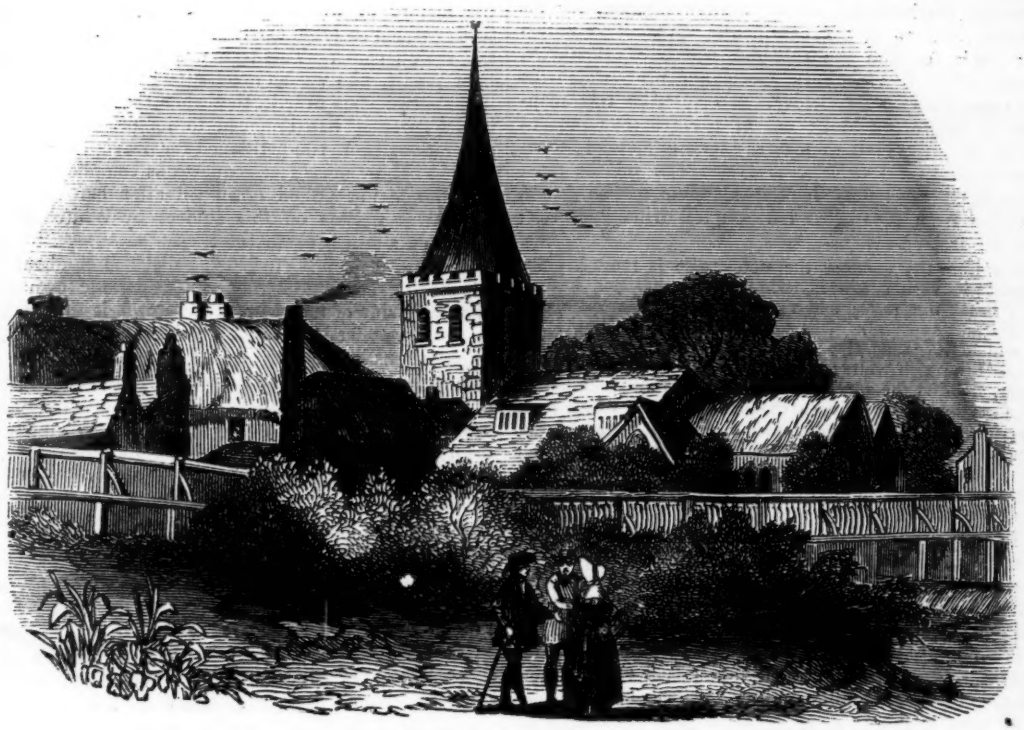
THE BANKS OF THE THAMES. II.



VIEW OF GREAT MARLOW.

Oft in her glass the musing shepherd spies,
The headlong mountains and the downward skies,
The watery landscape of the pendant woods,
And absent trees that tremble in the floods:
In the clear azure gleam the flocks are seen,
And floating forests paint the waves with green,
Through the fair scene roll slow the lingering streams,
Then foaming pour along, and rush into the Thames.

POPE.

IN our first article on this subject, we conducted the reader to a part of the Thames nearly parallel with the ancient town of Woodstock, and the magnificent seat of Blenheim;—the one carrying us back, in imagination, to the days of the Edwards and Henrys, and the other to the times of Queen Anne.

The town of Woodstock, considered in a commercial point of view, is not of much note; but the records of English history make frequent mention of it. It is said that Woodstock Park was a royal residence as early as the time of King Alfred, and that this monarch resided there while translating Boetius. Camden states, that in the time of King Ethelred, father of Edward the Confessor, it was so considerable a place, that he there held a convention of the states, and enacted several statutes. The park is supposed to have been enclosed by a stone wall in the time of Henry the First; and in the reign of Henry the Second, Woodstock was the scene of Fair Rosamond's brief but eventful history. The story of this maiden, of the monarch's affection for her, and of Queen Eleanor's revenge, have been woven into a kind of romantic legend, the truth of which cannot now be determined; but it is probable that, like the story of Joan of Arc, the maid of Orleans, the groundwork is correct, but the details have been highly coloured during the lapse of time. Be that as it may, of the bower and the mazy labyrinth, furnishing the scene of the story, no vestiges now remain. It has been asked—

What art can trace the visionary scenes,
The flowery groves and everlasting green,
The babbling sounds that mimic Echo plays,
The fairy shade and its eternal maze?

In Woodstock Park, Geoffry Chaucer, the "father of English poetry," is said to have been born in the early part of the fourteenth century; and to have resided there a considerable time, in a house near the area before the grand entrance to the palace.

Here he dwelt—
For many a cheerful day these ancient walls
Have often heard him, while his legends blithe
He sang, of love, or knighthood, or the wiles
Of homely life, through each estate and age,
The fashions and the follies of the world
With cunning hand pourtraying.

Woodstock Palace, two centuries afterwards, was the scene of the imprisonment of Elizabeth, during the reign of her unnatural sister Queen Mary, and it is said that the royal prisoner wrote the following lines, with charcoal, on the window-shutter of her apartment:—

Oh, Fortune! how thy restless wavering state
Hath fraught with cares thy troubled witt,
Witness this present prisoner, whither Fate
Could bear me, and the joys I quit.
Thou causedst the guilty to be losed
From bands wherein are innocents inclosed,
Causing the guiltless to be straites reserved,
And freeing those that death well deserved,
But by her malice nothing can be wroughte,
So God send to my foes all they have thoughte.

Anno Dom. 1555. ELIZABETH, prisoner.

In the reign of Queen Anne, Woodstock Manor, together with the dilapidated palace, were granted to the Duke of Marlborough, as an acknowledgment for his brilliant services in the continental wars. The nation also built for him the splendid palace of Blenheim, named after a village in Germany, near which he had gained a splendid victory. To describe this mansion at length, would be out of place in our present course of papers; but we may say that, in spite of numerous architectural defects, it forms one of the most magnificent residences in the kingdom. The grand entrance from Woodstock is through a triumphal arch; and Mr Ireland says:—

It is from this distance the stately pile is most happily viewed; its various towers, rising into the horizon, beautifully break the massy and more ponderous form it wears on a nearer approach. The verdure of the swelling lawn on which it stands, the spacious and easy slope inclining towards the rich valley below, aided by a fine expanse of water, wearing the appearance of a noble river, terminated by a spacious stone bridge, (the centre arch of which is of superior dimensions to the famed Rialto at Venice, being a hundred and one feet,) with a happy assemblage of rich groves and plantations in the distance, form a beautiful *coup d'œil*, surpassing anything I remember to have seen in this or any other country.

The expanse of water, here alluded to, was artificially formed; and Brown, the landscape-gardener who planned it, was so proud of its beauty, that he was wont to say, "that the Thames would never forgive him for what he had done at Blenheim."

We must now leave Woodstock and Blenheim, and return to the Thames, which flows past Oxford at a distance of eight or nine miles from Blenheim Palace. If we were unable to enter minutely into the details of this noble building, how much less can we do justice to this seat of education, with its numerous colleges and halls, and the associations with which it is so intimately connected, and by which we can trace back its existence for more than a thousand years.

Oxford is situated at the confluence of the Isis and the Charwell, the latter of which rivers flows southward through Oxfordshire to the point of junction with the former. The united streams wind their way through verdant scenery to the village of Ifley, about a mile and a half below the city. This village is situated on a beautiful eminence, commanding a distant prospect which includes almost every building in the university.

The river now flows almost directly southward, from Oxford to Nuneham Courtenay, a distance of about six miles; and, at the last-mentioned spot, we meet with the seat of the Earl of Harcourt, the representative of a very ancient family. The heiress of this manor married, in 1214, Robert de Courtenay, baron of Okehampton, and the manor thence acquired the name of Nuneham Courtenay. The estate afterwards came into various hands, until it finally became the property of the Earl of Harcourt. Of the ground surrounding the house, Mr. Brewer remarks:—

The park contains nearly twelve hundred acres, and vinces, in every division, great richness of natural circumstance, improved by the hand of reverential rather than of presumptuous art. Perhaps the talent of Brown*, who assisted in the arrangement of the grounds, was never displayed to greater advantage. Each artifice to heighten pictorial effect is so judiciously concealed, that the whole seems graceful in the simplicity of nature, though no superabundance obstructs the wishes of refined taste. From various points are obtained views of the Witenham hills, of a part of Buckinghamshire, and the high elevations above the vale of White Horse. A drive is formed which conducts to the chief objects of interest in the park, and continues through a wood that falls with a steep descent to the river Isis, the bank of which is here very abruptly and finely broken by steep and bold projections.

* This individual was a celebrated landscape gardener, employed in the early part of the last century in laying out the grounds belonging to many distinguished English mansions.

In the grounds of Nuneham Courtenay, is a tree known to the country people by the name of *Bab's tree*, the history of which marks the kind and considerate feeling which so often exists between the country nobility and their tenants. This tree was planted by one Barbara Wyatt, who was so much attached to it and to her humble residence near it, that when the village of Nuneham Courtenay was removed to its present site, some generations back, she petitioned for leave to remain in her old habitation. Her request was complied with, and her cottage not pulled down till after her death. A poem was written on this subject by Whitehead, and placed on a seat beneath the tree.

From Nuneham Courtenay, a distance of about four miles brings us to Abingdon, a considerable town on the Berkshire side of the river. This town is said to trace its records as far back as the time of the ancient Britons, when it was a town of considerable importance, and distinguished as a royal residence, whither the people resorted to assist at the great councils of the nation. We next learn, that it acquired the name of Abbendon (the town of the Abbey,) on the removal hither, in the year 680, of a monastic institution, to which the town belonged. Abingdon afterwards became a favourite residence of some of the Saxon monarchs; and William the Conqueror placed his son Henry under the care of the monks of the abbey, for his education. The subsequent history of the town was of that fluctuating character, which so frequently resulted from the politics of the period; but we need not trace it further.

Abingdon is pleasantly situated at the junction of the small river Ock with the Thames, or, rather, the Isis: it is handsomely built, consisting of several spacious streets, diverging from a central market-place; well paved and lighted, and amply supplied with water. The manufacture of woollens, formerly carried on here to a great extent, has quite declined. Malting is now the principal business, and, together with the dressing of hemp, and the making of sacking and sail-cloth, constitute the chief employment of the labouring classes. The number of inhabitants is between five and six thousand.

King Henry the Fifth, about the beginning of the fifteenth century, built two bridges over the Thames near Abingdon, at Culham and at Burford; and these bridges added much to the commercial importance of the town. Ashmole gives a translation of some Latin lines relating to these bridges:—

King Henry the Fifth, in the fifth of his reign,
At Burford and Culham did bridges build twain;
Between these two places, but from Abingdon most,
The king's highways now may be easily past;
In one thousand four hundred, and ten more by six,
This so pious work did his Majesty fix;
Ye passengers now who shall travel this way,
Be sure that you mind for the founder to pray.

The following appears to relate to one of the bridges, but is in English of a more ancient date:—

King Henry the Fifte, in his fourth yere,
He hath y'found for his folke a bridge in Berkeschure,
For cartis with cariage may goo and come clere,
That many wynters afore were marred in the mire.
And som ouk of her sadels fleete to the grounde
Went forthe in the water wist no man whare.
Five wekys after, or, they were y'founde,
Her kyn and her knowlech caught hem up with care.

The appearance which the river presents depends a good deal on the proximity of considerable towns. In the open country, where green fields descend nearly to the water's edge, and country residences are seen at a distance, many picturesque and beautiful scenes present themselves, which have often formed studies for the landscape painter. In those parts, on the contrary, where a market town stands on the banks of the river, the Thames voyager sees wharfs and other commercial indications, whereby the thoughts of a miniature London are presented to his mind. Abingdon, Reading, Henley, Great Marlow, and other towns, occur, in this way, at intervals along the route; but it cannot be doubted that the occasional view of commercial industry, alternating with more serene natural objects, give a variety to the scene which greatly enhances its interest. We cannot fully appreciate the beauty of nature's productions, unless we occasionally compare them with the ruder works of man.

WAXEN FRUIT.

HAVING shown in a former article* the method of preparing *artificial-flowers in wax*, we propose here to disclose the usual process of producing FRUIT and other objects in WAX. We must, therefore, speak *first* of the moulds;—*secondly*, of the casting;—and *thirdly*, of the colouring.

1. Before we can proceed to work in making the *moulds*, it is necessary to have the following articles at hand:—a little grease and some superfine plaster of Paris, together with a basin, a spoon, a table-knife, a pot full of damp sand, some thin tinned iron, which must be cut into strips of three inches wide, and some string.

Now, if we wish to make a mould for an apple, for instance, we of course take a real one to mould from. We press down the apple into the damp sand, until nearly one-half of it is buried,—that is, until the sand reaches the thickest part, which, in an apple, is near the middle; and in a pear, near one end. A pear may be inserted sideways; but an apple must not: because the latter would not then *deliver*;—that is, when the upper part is surrounded with the hardened plaster, as it soon will be, it cannot be drawn out, on account of the depression at the stalk and eye of the apple: but, by placing it with the stalk or eye end downwards, this difficulty is avoided. In making moulds of every description, it is necessary above all things to set out with precautions of this nature.

When the apple is nearly half sunk in the sand, bend one of the pieces of tin into a hoop, so as to be an inch or thereabouts larger across than the apple; tie a piece of string round it, and place it over the apple, forcing its lower edge into the sand, so as to hold it firmly. Put water to some plaster of Paris in the basin, so as to make the mixture of the consistence of thick cream;—it will thus run into every minute depression, and completely cover up the half of the apple exposed above the sand, while it will be prevented from flowing away by the rim of tin around.

In a minute or two the plaster will become sufficiently *set*, or hardened, to be handled. When this is the case, remove the tin, and take up the fruit out of the sand altogether, there being now one half of the mould cast. This must be trimmed with a knife, for the sake of appearance; and particularly where the sand has touched, cut carefully smooth at the exact half of the fruit; for it will have been observed, that, as the apple was not quite half buried in sand, the part of the mould now cast will be rather more than half, a small part being allowed for cutting away evenly. Now make a hole or two, or a few notches, on one side of the cast, where the other is to join it; grease this part well, holes and all, and tie round it tightly one of the pieces of tin: the fruit will now be in the same position, in respect to the half-mould, as it was when in the sand, except that it is now the other end upwards. Now pour plaster upon this other end, and the mould will be complete, except a little trimming, which it will require. The parts will easily separate at the joining, and, on taking out the real fruit, a cavity will of course be found of the exact size and shape, ready for filling up with wax.

Those fruits which have hard or rough skins, require greasing, to prevent the plaster from sticking to them: this is the case with the peach, apricot, and walnut,—the almond, &c. A few fruits require the mould to be in three pieces,—such as the melon, mulberry, and blackberry. Other fruits are never thus imitated in wax; as grapes, currants, and many more of the smaller kinds, on account of the trouble of joining them together afterwards in bunches.

2. In order to enter upon the process of *casting*, it is necessary to have in readiness several small pipkins, some white wax or spermaceti, a basin of cold water, and the following colours:—the palest chrome yellow, Prussian blue, burnt umber, red lead, flake white, and lake, all in powder, or rather, ground up with oil, as used for painting.

The process of casting all of the larger fruits is the same: but, as we may suppose our apple-mould to have been prepared, we will proceed with the process of casting the wax.

Melt some of the wax slowly over a small fire; and when melted, add a little chrome yellow, and, if we would choose to have a green apple, we must put a very little Prussian blue along with it. While this is going on, the mould should be soaking in the basin of water. When the wax is ready, take the mould out of the water and wipe the inside of it dry with a cloth. Pour the melted wax into it, holding one half of the mould in the hand, until it is nearly full; put the other half-mould over in its exact position, which will be indicated by the various notches or holes cut in the sides. Next, hold the two parts tightly together, and turn them over and over, until the melted wax within has spread itself on every part of the inside of the mould. Thus continue it in motion, until the wax is completely set, or congealed, which will be after a minute or two, and may be known to be the case, when, by shaking the mould, no noise of a liquid is heard within. When thus partly hardened, it must be placed for some minutes in the basin of cold water, when most probably the mould will separate of itself; if it does not, very little trouble will suffice to remove it from off the apple, which, as to its casting, is now complete, and will of course be found more or less hollow in proportion to the quantity of wax employed.

In imitating large fruit, the hot air within the mould, having no vent, will sometimes make the wax spurt from the joint: this is to be avoided by holding the filled mould upright a few seconds before turning it about. The edge around the cast fruit where the two sides of the mould joined, must be pared off carefully with a knife. All the foregoing process may be followed up in casting oranges, lemons, eggs, yellow-plums, walnuts, pea-pods, capsicums, &c.

3. In the last-named fruits due regard must of course be had to the variation of *colour*. If the fruit be partly coloured in the process of casting, much care in after painting is requisite.

Suppose we wish to have a red blush on the apple, a little dry lake is taken up with a bit of flannel, and rubbed evenly on the side of the fruit. If a streaked apple be wanted, mix a little lake with spirits of turpentine; then, taking a small quantity in a short-haired, stiff brush, jerk it out of the brush on to the fruit, when it will run down the sides and produce the desired effect. If any peculiar marks are to be imitated, they may be painted with any of the above-named colours, mixed with

* See *Saturday Magazine*, Vol. XVI., p. 204.

mastic varnish. This varnish is also used, when it is desired that the fruit should be very shining, as cherries are: but, if rough-coated fruit be wanted,—as, for example, the peach,—it must be cast as usual, then coloured on one side with dry lake, varnished, and, immediately after varnishing, sifted over with paper powder. The bloom of red plums, and of dark grapes, is made by dusting over them powder-blue from a muslin bag.

Strawberries, cherries, and other small fruit, are always cast solid; that is, after the mould is made, instead of pouring in the wax to the one-half of the mould, and putting the other half on it, a hole is made at the crack between the two halves, and the mould being held upright, wax is poured in, until it is full.

Grapes are formed of glass globes made on purpose; these are of different sizes, and have each a small nozzle or mouth like that of a phial. To fit them up in bunches take some pieces of iron wire; twist a piece of sewing cotton near one end of each wire, so as to fit the mouth of a certain grape; dip it into melted wax, and insert it into the mouth, when it will become fixed there: then dip the grape thus formed into melted wax coloured lightly with green: by taking it out instantly it will dry, having a coat of the wax upon it, which makes it look very much like a real grape. These grapes should be tied together in bunches of about thirty in a bunch. Currants are made with smaller glass globes, but in a similar manner: to give them the peculiar appearance of the opaque lines seen upon them, a piece of sewing cotton is to be wound in sections round the fruit previous to dipping. The remains of the flower at the end of an apple, pear, &c., is imitated by a clove being thrust into the waxen image.

Anatomical preparations, of which many are so complex, and so finely illustrative of morbid anatomy, cutaneous disorders, &c., are all effected according to the directions given for waxen fruit, and coloured, after casting, with common oil colours by precise similar methods. Hence it is, that a consideration of the processes before described, cannot be deemed to be a waste of time.

The principal objects manufactured in wax for ornament, are fruits, various articles of pastry, eggs, peas in the pod, capsicums, dolls, miniature busts, flowers, leaves, &c. Miniature busts and wax dolls are coloured with flake white and lake; and they are also much better, if a little Canada balsam be mixed with the wax.

BODILY labour is of two kinds, either that which a man submits to for his livelihood, or that which he undergoes for his pleasure. The latter of them generally changes the name of labour for that of exercise, but differs only from ordinary labour as it rises from another motive. A country life abounds in both these kinds of labour, and for that reason gives a man a greater stock of health, and, consequently, a more perfect enjoyment of himself, than any other way of life. I consider the body as a system of tubes and glands, or, to use a more rustic phrase, a bundle of pipes and strainers, fitted to one another after so wonderful a manner as to make a proper engine for the soul to work with. This description does not only comprehend the bowels, bones, tendons, veins, nerves, and arteries, but every muscle and every ligature, which is a composition of fibres, that are so many imperceptible tubes or pipes interwoven on all sides with invisible glands or strainers.—ADDISON.

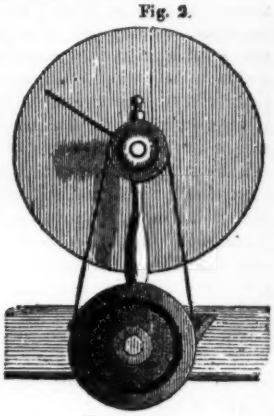
HAPPINESS and misery are the names of two extremes, the utmost bounds whereof we know not; but of some degrees of both, we have many lively impressions, by delight on the one side and sorrow on the other, and therefore we may distinguish them by the names of pleasure and pain. Happiness in its full extent, is the utmost pleasure we are capable of, and the lowest degree of it, so much ease from all pain, and so much pleasure, as without which one cannot be content, we therefore judge that whoever is contented is happy.—LOCKE.

OPTICAL ILLUSIONS. II.

Fig. 1.

FRONT VIEW.

Fig. 2.



BACK VIEW.

WE resume our consideration of those curious phenomena connected with optical science, whereby objects are made to appear under a different form from that which we know they really possess. One remarkable class of such phenomena includes those in which a rapidly rotating body appears to be stationary.

Professor Wheatstone, in the *Philosophical Transactions* for 1834, describes a series of experiments by which it appears probable that the electric fluids in passing through a conducting wire from one side of a charged jar to the other, rush through the conductor with a velocity equal to about 576,000 miles in a second of time. This velocity is so great that the most rapid motion which can be produced by art appears to be actual rest when compared with it. A wheel revolving with celerity sufficient to render its spokes invisible, when illuminated by a flash of lightning, is seen for an instant with all its spokes distinct as if it were at rest; because however rapid the rotation may be, the light has come, and has already ceased before the wheel has had time to turn through a sensible space. Any one who has an electrical machine may perform a similar experiment. Provide a disk, similar to that shown in Fig. 1, the surface of which is divided into black and red spaces. If this disk be connected with a multiplying arrangement, as shown in the same figure, and be rotated rapidly, the black will vanish and the disk appear entirely red; for the black reflects no light, and the reflection proceeds only from the red. If the disk be made to rotate before a Leyden jar in such a manner that it may be viewed by the light of the electric discharge, the black and red spaces become as apparent as when the disk is perfectly stationary. It matters not, of course, what device is painted on the disk, nor how rapidly soever it is turned round; it appears to be quite motionless whenever the electric flash illuminates it. We have performed the experiment during a thunder storm by night, when the broad and distinct flashes of lightning caused a series of rapidly rotating disks to appear quite stationary, to the admiration of those who witnessed this remarkable experiment. These results are better appreciated in a darkened room; but the presence of natural or artificial light does not interfere with their production.

Mr. Tomlinson has found that similar effects can be produced with phosphuretted hydrogen, exhibited in bubbles from phosphuret of lime, in water. These bubbles produce a sudden and transient light, and when they come up slowly without interrupting each other, the light which they shed on the rotating disk causes the latter to appear stationary; but when the bubbles come up too quickly, the black and red spaces exhibit a sort of dancing motion, sometimes two black spaces seeming to be joined into one, to the exclusion of the intervening red, and vice versâ. So also with a disk on which words, such as AT REST, are inscribed; if the bubbles of gas start up regularly and slowly, the words are presented

to the eye in their proper form; but if too quickly the words seem to cross each other in various directions, and confusion is excited, by a second impression being produced on the retina before preceding impressions have departed. A rapid succession of sparks from a magnet, as also a *stream* of electricity instead of a discharge, will similarly produce confusion in the appearance of the device or inscription.

Any chemical action by which a sudden and transient light is produced, will show similar effects. Soap bubbles, blown with hydrogen or the mixed gases, and fired by means of a filament of cotton passed through a small tube, and wetted with alcohol; gunpowder, wrapped up in the form of a common cracker; fulminate of mercury, struck on an anvil; and many other manipulations, will produce flashes of light fitted for this purpose.

In all these cases, the effect is produced by the following circumstance; that the light comes and goes in a space of time too short for the disk to have rotated through any sensible space. Supposing the disk to be six inches in diameter, and consequently about half a yard in circumference, and that it rotates twenty times in a second, then any point of the circumference will move through $18 \times 20 = 360$ inches in a second. And if we further suppose, for the sake of clearness, that a flash of light, produced in any of the ways explained above, has a duration of only $\frac{1}{3600}$ of a second; then any point in the circumference of the disk will only move through one-tenth of an inch during the existence of the light, a space too small to produce any considerable effect on the apparently stationary position of the disk. Now, small as is this fraction of a second, we know that the real duration of the flashes of light produced as above must be much smaller, for the disk may have a greater velocity given to it than that here supposed: indeed, so far as electrical light is concerned, Professor Wheatstone has shown that its duration cannot be so much as the millionth part of a second!

Mr. Tomlinson has also discovered a very curious and pleasing class of phenomena, (linked in some respects with those given above,) in which a rotating object appears stationary, and at the same time the straight lines occurring in the device appear curved.

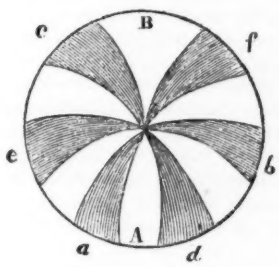
There are two modes in which these experiments may be performed; 1st, Procure a circular disk of pasteboard, twelve or thirteen inches in diameter, and cut a narrow slit in it, extending from the centre nearly to the circumference. Fix this disc to a multiplying machine, and place a lamp behind it. Let the smaller machine, with the painted or written device, be placed in front of the larger, and while both are rotating, the light from the lamp passing through the slit once and only once in each revolution, will fall suddenly and transiently on the coloured disk, producing effects which we shall presently describe. 2nd, Dispense with the lamp, and stand behind the slitted disk; while in front of it, at a distance of two or three feet, place the radiated disk, and cause both to revolve. When the two disks are thus made to rotate, all the radii, excepting those which for the time being are vertical, appear curved,—*upwards* if the eye of the observer is above the axis of the slitted disk, and *downwards* if below. This effect takes place when the two disks are revolving in similar directions. The order will be inverted if the disks move in opposite directions, and a change will likewise take place in the direction of the curvature of the radii, according to the angle at which the eye is placed.

In order to convey to the mind of the reader a clear idea of the effects produced, it will be desirable to give illustrative figures; but here we meet with this difficulty, that the effects produced are different according to the relative sizes of the disks,—their relative velocities,—their respective rotations being in the same or in opposite directions,—the situation of the slit,—and the part of the slit to which the eye is applied. To give a determinate character to the experiments, therefore, it will be better to make a slit in the disk which is the object of experiment, and to view, with the eye placed behind this slit, the image of the rotating figure reflected in a stationary plane mirror, placed in front of the disk, at a distance of about two feet. Thus, by considering the revolving image as a second revolving disk, the following conditions are fulfilled: 1, The two disks are of equal size: 2, They rotate with equal velocities: 3, They rotate in the same direction.

With such an apparatus as this many pleasing experiments may be performed, by fixing to the multiplying wheel disks having different devices. One which we have used is such as is represented in the disk, a front view of which is shown in the multiplying wheel at the head of this article. The disk is covered with a star, consisting of six black and six red radial bands, and a slit, A B, occupies nearly a semidiameter in the centre of one of the bands. The eye is placed behind the disk, so that the front of the disk may be seen reflected in the mirror, which occurs once during one revolution of the disk; and if the disk perform more than six revolutions per second, a tolerably uninterrupted view of the image is obtained, on account of the persistence of impressions on the retina.

Under these circumstances the disk assumes the appearance represented in the annexed figure, (Fig. 3,)

Fig. 3.



subject to variations in the curvature of each radius, according to the position of the eye with reference to the inner or outer end of the slit. When the eye is near the inner end of the slit, and consequently near the centre of the disk, the radii appear congregated much nearer the point A, while at and about B the interval between the two upper radii is greatly increased, but if the eye be held near the outer end of the slit, the radii appear less curved, and their distribution more equable. But at whatever part of the slit the eye be applied, this rule is constant,—that the point A, towards which the curves tend, is seen at the axial end of the slit, in consequence of the slit being only at one side of the axis, and the radial band occupying that position is of the same colour as that which contains the slit. If, however, the slit, instead of occupying the centre of one radial band, be on a line of division between two bands, a line of division will occupy the central position which in the former case was occupied by a band, and, in the latter case, the bands *a b c*, will be opposite in colour to *d e f*, as shown in the figure.

In another paper we shall show other curious effects produced on disks of various kinds.

As it is not enough for a man to have a diamond unless it is polished and cut out into its due angles, and a foil be set underneath, whereby it may the better transmit and vibrate its native lustre and rays; so it will not be sufficient for a man to have a great understanding in all matters, unless the said understanding be not only polished and clear, but underset, and holpen a little with those figures, tropes, and colours, which rhetoric affords, where there is use of persuasion.—Lord Herbert.

ENCAUSTIC PAINTING.

THAT the ancients excelled the moderns in certain artistical pursuits, and that they were adepts in processes now lost, or imperfectly known, seems generally admitted. Among such pursuits, we may reckon the art of ENCAUSTIC PAINTING, which seems to have been completely lost during several ages between the time of Pliny and the eighteenth century.

The art of painting *in encaustic* is a manner of painting which is executed by the operation of fire. Ancient authors often make mention of this species of painting, which if it had been described simply by the word "encaustic," which, signifies *executed by fire*, might be supposed to have been a sort of *enamel*-painting. But, in the kind of painting which we are considering, wax was employed to give a gloss to the colours, and permanence to the work: these colours were fixed by fire, and preserved by means of the wax from being injured by the air. This mode of perpetuating colours in all their original splendour by heated or burnt wax, was practised in the fourth and fifth centuries, and is *said* to have been in use at Venice even to the time of Titian. By one writer we are told that various specimens of ancient encaustic painting have been preserved in the East: while another says that we have no ancient pictures of this description: but the questions here probably are,—what *species* of pictures are meant? and beyond what point of time does *antiquity* refer?

We must not, however, omit to notice three species of encaustic painting, described by Pliny, who flourished in the first century of the Christian era:—

1. That in which they used the graver, and painted on ivory or polished wood; for which purpose they drew the outlines on a piece of this wood or ivory, previously soaked or imbued with some certain colour: the point of the style or graver served for this operation, and the broad end to scrape off the small filaments that rose from the outlines; and they continued forming outlines with the point, till they were finished.

2. It seems, in this case, that the wax was previously impregnated with colour, and spread over the surface of the picture with the style; the colours thus prepared being formed into small cylinders for use. By the side of the painter was a brazier for keeping the styles continually hot, with the points of which they laid on the colours when the outlines were finished, and then spread them smooth with the broad end; and thus they proceeded till the picture was finished.

3. This process was by painting with a pencil in wax liquefied by fire: by this method the colours contained a considerable hardness, and could not be damaged either by the heat of the sun, or the action of seawater. It was thus that they painted their ships with emblems and other pictures; and therefore it obtained the name of *ship-painting*. The last process was to smooth and polish the picture.

The first persons of modern times who made experiments in this branch of art were Count Caylus and M. Bachelier. The former is spoken of in the letters of Lady Mary W. Montagu. These experiments were begun to be made about the year 1749. Some years after, Count Caylus presented to the Academy of Painting at Paris, his ideas and experiments on the subject of the ancient manner of painting in encaustic. In 1754 the count had a head of Minerva painted by M. Vien, after the process described by himself, and presented it to the Academy of Sciences in the following year. This success induced M. Bachelier to recommence his experiments, in which he succeeded better than before: but his manner of painting in encaustic differed from that of the ancients, as described by Pliny; and, therefore, he was unsuccessful, inasmuch as he did not discover the *real* ancient mode as used in all particulars for producing the desired effects. After this he made some other experiments on the same subject, differing from the process as described by Caylus and others.

The process pursued by M. Bachelier for performing the operation of *inustion*, or burning in, which is the main characteristic of the encaustic painting, was as follows:—The cloth or wood designed for the basis of the picture, is waxed over, by merely rubbing it with a piece of bees' wax; the wood or cloth is stretched on a frame, and held before a fire, at such a distance that the wax may gradually melt, while it is rubbed on, diffuse itself, penetrate the body, and fill the interstices of the texture of the cloth, which, when cold, is fit to paint upon. But, as water-colours will not adhere to the wax, the whole picture must first be rubbed over with Spanish chalk or white, and then the colours applied to it: when the picture is dry, it is put near the fire, whereby the wax melts, and absorbs all the colours.

Several improvements in this art were proposed by Mr. J. H. Muntz. When the painting is in cloth, he directs it to be prepared by stretching it on a frame, and rubbing one side several times over with bees' wax, or virgin wax, till it is covered with a coat of considerable thickness. In fine linen this is the only operation necessary, previous to painting; but coarse cloth must be rubbed gently on the unwaxed side with a pumice-stone, to take off all those knots which would prevent the free and accurate working of the pencil. Then the subject is to be painted on the unwaxed side with water-colours; and, when the picture is finished, it must be brought near the fire, that the wax may melt, and fix the colours. This method, however, can only be applied to cloth, paper, or other substances, through which the wax can pass; but in wood, stone, metals, or plaster, the method before described, may be observed.

In the year 1787 Miss Greenland, an amateur of painting, communicated to the Society of Arts the knowledge of this art, which she had acquired during her residence at Florence, and at the same time made a present to the Society of a picture executed by herself, for which she received the honorary reward of a gold pallet. This picture is still preserved in the Society's rooms at the Adelphi, and is worth the attention of the artist. This clever and ingenious lady appears afterwards under the name of Mrs. Hooker, of Rottingdean, in the county of Sussex. The following are her instructions:—

Take an ounce of white wax, and the same weight of gum mastich, powdered. Put the wax in a glazed earthen vessel, over a very slow fire, and when it is quite dissolved, throw in the mastick, a little at a time, stirring the wax continually until the whole quantity of gum is perfectly melted and incorporated: then throw the paste into cold water, and when it is hard take it out of the water, wipe it dry, and beat it in one of Mr. Wedgwood's mortars, observing to pound it first in a linen cloth, to absorb some drops of water that will remain in the paste, and prevent the possibility of reducing it to a powder, which must be so fine as to pass through a thick gauze. It should be pounded in a cold place, and but a little while at a time, as after long beating the friction will in a degree soften the wax and the gum, and instead of their becoming a powder, they will return to a paste. Make strong gum-arabic water, and when you paint take a little of the powder, some colour, and mix them together with the gum-water. Light colours require but a small quantity of the powder, but more of it must be put in proportion to the body and darkness of the colours, and to black there must be almost as much of the powder as colour. Having mixed the colours, and no more than can be used before they get dry, paint with fair water, as is practised in painting with water-colours, a ground on the wood being first painted of some proper colour, prepared in the same manner as is described for the picture; walnut tree and oak are the sorts of wood commonly made use of in Italy for this purpose. The painting should be very highly finished, otherwise, when varnished, the tints will not appear united. When the painting is quite dry, with rather a hard brush, passing it one way, varnish it with white wax, which should be put into an earthen

vessel, and kept melted over a very slow fire till the picture is varnished, taking great care that the wax does not boil. Afterwards hold the picture before the fire, near enough to melt the wax, but not to make it run; and when the varnish is entirely cold and hard, rub it gently with a linen cloth. Should the varnish blister, warm the picture again very slowly, and the bubbles will subside. When the picture is dirty, it need only be washed with cold water.

Nearly all the colours that are used in oil-painting may be employed in the encaustic method, and likewise many which cannot be admitted in oil-painting, as red lead, red orpiment, crystals of verdigris, and red oxide of mercury. The crayons used in this sort of painting are the same as those used in the common way of crayon painting, excepting those that are in their composition too tenacious, and the manner of using them is the same in both cases. Encaustic painting has many peculiar advantages: though the colours have not the natural vanish or shining they acquire with oil, they have all the strength of painting in oil, and all the airiness of water-colours, without partaking of the apparent character or defects of either. They may be viewed in any light and in any situation, without any false glare; the colours are firm, and will bear washing; and a picture, after having been smoked, and then exposed to the dew, becomes as clean as if it had just been painted. In re-touching, the new colours unite with the old ones.

The Chevalier Lorgna has deeply investigated the subject of encaustic painting. He seems to think that the part of the art in which the moderns fail relates to the *wax* used in the process. He thinks that we have never thoroughly known the nature of the Punic wax, which was anciently used, and which, after all, was the essential ingredient of the ancient painting in encaustic. Now Pliny describes the method of preparing this wax, but Lorgna says that the *nitre* which the Roman naturalist speaks of is not the modern nitre, properly so called, but the *natron* of the ancients, or the native salt which is found crystallized in the north of Africa, in Egypt, and in other hot countries, in sands surrounding lakes of salt water: it must not be mistaken for the natron of the new nomenclature of our College of Physicians, which is the new name of the mineral alkali.

As the thing chiefly regarded in encaustic painting was the securing of permanence and durability by the application of fire, the word "encaustic" has been applied, in a very general sense, to other processes, in which both the material and the mode of applying the heat are entirely different from the ancient materials and modes. The word has been used, not only of wax-painting on earthen vessels, and on works in metal, where gold and silver were inlaid, melted, or laid on, and of everything which was gilt or silvered by fire, which was called *gold* or *silver encaustic*. The moderns have also used the term for painting on porcelain, and working in enamel, and in the same way it was given to the painting on glass in the middle ages, such as is now seen in the windows of Gothic churches. All these have nothing to do with the wax-painting of the ancients.

Many persons have made attempts in this art during the present century. J. G. Walter, in Berlin, and Professor J. Roux, in Heidelberg, have recently given their attention to these wax-paintings, some of which are said to have been successfully executed. Mr. Peter Kraft, at Vienna, has also lately painted several pieces on walls, in which, however, only the warmed ground was covered with wax, and the colours mixed with oil of turpentine laid on it. Montabert's process is said to bear a greater resemblance to encaustic painting, properly so called. The laying on is nearly in the manner just mentioned, but a wax varnish is spread over the colours, and melted in by means of a kind of brazier. A series of paintings has been executed, after his directions, on the walls of the royal palace at Munich, since 1831, but even here, all the difficulties with respect to the durability of the ground and the colours have not been overcome.

Professor Reinagle is said to possess a painting of Cleopatra, executed in encaustic, which is valued at 2000*l*.

THE HORNBEAM, (*Carpinus betulus.*)

THE *Hornbeam* is principally cultivated in Britain as a shrub and underwood, and is excellent for forming tall hedges or screens in nursery grounds or ornamental gardens. It is not commonly found as a timber tree, though it may be reared for this purpose, and will grow to a considerable height. It is a tree of quick growth, and has a glossy verdure which is very pleasing to the eye. Evelyn, speaking of the Hornbeam, says, that the wood is white, tough, and flexible, and that it is useful for mill-work, handles of tools, and various other purposes. He also says that,—

Being planted in small fosses, or trenches, at half a foot interval, and in the single row, it makes the noblest and the stateliest hedges for long walks in gardens, or parks, of any tree whatsoever, whose leaves are deciduous, and forsake their branches in winter; because it grows tall, and so sturdy as not to be wronged by the winds. Besides, it will flourish to the very foot of the stem, and flourishes with a glossie and polished verdure, which is exceeding delightful, of long continuance, and of all other of the harder woods, the speediest grower; maintaining a slender upright stem, which does not come to be bare and sticky in many years.

Boutcher, of Edinburgh, in his work on trees, minutely details the best mode of cultivating and propagating this tree, when intended to form a hedge. The common Hornbeam should be propagated by seeds, which, being ripe in Autumn, ought first to be spread in a loft till dry, and then mixed with sand till the following spring. They may then be sown thin on beds of fresh earth, three and a half feet broad, with paths or alleys eighteen inches wide between the beds; and covered three quarters of an inch deep with mould. These seeds will remain a year in the ground before the plants appear; during which time the earth must be kept clean. In the following February the surface of the beds should be loosened with a short-toothed rake, so as not to disturb the seeds, and a gentle covering of fresh mould thrown over them: in this state they may remain for two years, if not too thick; since the plants make slow progress the first season, and are naturally well rooted.

From the seed bed they are to be removed, about the month of October, into any fresh spot of ground, even of indifferent quality; the superfluous roots are then to be reduced, cutting away such as cross one another; and after this they are to be planted in rows, two feet and a half asunder, and a foot distance in the row. Thus they are to remain three years, digging the ground, between the rows, annually. By this time the plants will be in a fit state for hedges, in a spot where immediate shelter is required, or to be mixed with other young trees to form woods.

But if they are required for a hedge which is to form an ornamental boundary or enclosure, a different plan must be adopted. If the hedge is to be seven or eight feet high, remove the young plants from the former nursery to another, and place them in rows, the rows being ten feet asunder, and the plants five feet asunder in each row. These should then be trained annually in the regular hedge form, but always observing to keep them light and thin at the top. After remaining in this state about four years they may be taken out, and planted as a hedge at the spot where they are intended to remain: by this time they will have acquired such abundance of roots as to be able to defy the strongest winds; and they will now require no farther expense and trouble than to keep their roots clean for three or four years.

Those straighter plants which may be intended for single trees, may, at raising them from the first nursery, be separated from those for hedges, and planted in rows,

five feet asunder, and two feet distance from each other in the row: these are then to be annually pruned in their proper form, and from hence they may be removed to the places where they are intended to remain, after three or four years' standing. Mr. Boutcher remarks,—

Though I am no advocate for the Hornbeam tree in ornamental plantations, or in generous soils and sheltered situations, yet its being one of the hardiest trees known, the many good qualities of the wood, and the sudden shelter and warmth which hedges formed of it are calculated to afford, appear to give it some claim to our attention, particularly in the cold exposed parts of the country. It will grow surprisingly on the coldest hills, and in the stiffest, barren and otherwise worthless ground; nor do I know any useful timber tree that maintains itself so stoutly against the winds; so that, being of quick growth, and clad in its numerous leaves all the winter, it is certainly one of the fittest plants to nurse and rear up other valuable or delicate trees. This likewise, of all trees yet known, best preserves itself from the bruttings of deer; so that clumps of them, in deer-parks, would be no small improvement, both in point of beauty, and for shelter to these animals.

The Hornbeam affords excellent stakes and posts; and the timber produced by it may be ranked with those of the beech and sycamore. It has been stated by other writers as well as Evelyn, that the wood of the Hornbeam is useful for many manufacturing purposes; but a French writer speaks of it as being too brittle for cabinet work. Its trunk, according to him, is seldom regularly grained, and still more rarely well rounded. The texture of its fibres is singular: its annual layers are not uniformly circular as in most other trees, but assume an undulated or zig-zag form: and its transverse fibres, which pass from the circumference to the centre, have considerable intervals between them; the wood is consequently refractory under the workman's tool, and apt to break into splinters. Its principal superiority is said to consist in its excellences for the purpose of screen fences for sheltering gardens, nursery grounds, plantations, &c., from the severity of bad seasons, &c. It bears cutting in, pruning, and clipping, extremely well; and, from its retaining its leaves during the winter season, becomes particularly close and impenetrable to winds and storms, keeping up a very steady temperature of the atmosphere about the plants which it shelters. On this account, also it is found beneficial to be planted in mixture, or in occasional rows, with many tender sorts of trees in high exposed aspects, in the manner of the birch, to which it is preferable, as affording greater warmth in the winter.

The botanical characteristics of the common Hornbeam are chiefly these:—*Trunk* tolerably straight, but often imperfectly cylindrical:—*Bark* even, whitish, marked with grey spots; branches numerous:—*Leaves* about three inches long and two broad, alternate, petioled, ovate, acuminate, doubly serrated, smooth, wrinkled above, with straight and parallel veins below, remaining on the tree in a withered state during the whole winter. *Male catkins* about an inch long, lateral, solitary, appearing in Spring a little before the leaves; scales ferruginous, concave, ciliated. *Female catkins* terminal, solitary, peduncled, loose; scales green, smooth, with three lanceolate lobes, of which the middle one is largest; *nut* small, ovate, lenticuarly compressed, striated, with longitudinal, filiform ribs; crowned with six, or, according to Scopoli, four teeth, seated at the bottom of the permanent enlarged scale. Our cut represents that part of the plant connected with the flower, such as the male and female catkins (flower sheaths), &c.

Mr. Gilpin, who was accustomed to view trees with an eye always in search of the picturesque, did not think that the Hornbeam had much in its natural form to excite pleasing ideas; but he adds that still, as a botanical antiquary, he could not look upon it without a certain degree of pleasure, when he remembered that our ancestors used it for producing an artifical climate around their ancient castles, by planting it in long lines, and trimming it into vegetable walls of the most mathematical exactitude.

I WOULD advise all the professors of the art of story-telling, never to tell stories, but as they seem to grow out of the subject-matter of the conversation, or as they serve to illustrate, or enliven it. Stories, that are very common, are generally irksome; but may be aptly introduced, provided they be only hinted at, and mentioned by way of allusion. Those that are altogether new, should never be ushered in, without a short and pertinent character of the chief persons concerned; because by that means, you make the company acquainted with them; and it is a certain rule, that slight and trivial accounts of those who are familiar to us, administer more mirth than the brightest points of wit in unknown characters. A little circumstance in the complexion or dress of the man you are talking of, sets his image before the hearer, if it be chosen aptly for the story.—STEELE.

AN obstinate man does not hold opinions, but they hold him; for when he is once possessed with an error, it is like a devil, only cast out with great difficulty. Whatsoever he lays hold on, like a drowning man, he never loses, though it do but help to sink him the sooner. His ignorance is abrupt and inaccessible, impregnable both by art and nature, and will hold out to the last, though it has nothing but rubbish to defend. It is as dark as pitch, and sticks as fast to anything it lays hold on. His scull is so thick, that it is proof against any reason, and never cracks but on the wrong side, just opposite to that against which the impression is made, which surgeons say does happen very frequently. The slighter and more inconsistent his opinions are, the faster he holds them, otherwise they would fall asunder of themselves: for opinions that are false ought to be held with more strictness and assurance than those that are true, otherwise they will be apt to betray their owners before they are aware. He delights most of all to differ in things indifferent, no matter how frivolous they are, they are weighty enough in proportion to his weak judgment; and he will rather suffer self-martyrdom than part with the least scruple of his freehold; for it is impossible to dye his dark ignorance into a lighter colour. He is resolved to understand no man's reason but his own, because he finds no man can understand his but himself. His wits are like a sack, which the French proverb says is tied faster before it is full than when it is; and his opinions are like plants that grow upon rocks, that stick fast though they have no rooting. His understanding is hardened like Pharaoh's heart, and is proof against all sorts of judgments whatsoever.—BUTLER.

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